

### **Remarks/Arguments**

Claims 1, 5-6, 13, 14, 16-22, 43, 50 and 52-63 are pending in the application. The claims stand variously rejected. Applicants respectfully request reconsideration on the merits and allowance of the claims in light of the arguments presented below.

### **Rejections Under 35 U.S.C. § 103(a)**

Claims 1, 5-6, 13-14, 16-22 and 43 were rejected as unpatentable over Handley (U.S. Patent No. 5,491,090) in view of Schuller (Plant Cell 60:23-31 (2000)) and further in view of Find (U.S. Patent No. 6,897,065). The Examiner noted that our arguments made in the last response were found unpersuasive for several reasons. The combination of these references does not teach or suggest each element of claims 1 or 43 or any claim dependent therefrom. Specifically, none of the references teach or suggest use of lactose and an additional sugar in an induction, maintenance or prematuration media for *Pinus taeda* somatic embryogenesis.

Without reiterating our prior response, Applicants note that the Examiner's contention that it would have been obvious to substitute sugars in one developmental stage with those known to be useful in a distinct developmental stage is not supported. In fact, the declarations, cited art and examples support that not only are different developmental stages defined by the use of distinct growth hormones, but also by use of distinct media components such as sugars and osmoticum. Lactose was believed to function as an osmoticum in the maturation medium of Find. This distinct function of the lactose used in the maturation medium of Find would lead those skilled in the art away from including lactose in an induction, maintenance or prematuration media, rather than toward such a result. Find is combined with Handley, which

only mentions use of combinations of sugars, but does not exemplify any particular combinations or teach the use of lactose, and Schuller, which teaches use of lactose and sucrose for *Abies alba* culture. Schuller teaches away from generalization to other conifers by stating in the first sentence of the Introduction that “[s]omatic embryogenesis in *Abies alba*... is different from that in other conifers since the induction and proliferation of ESM could be achieved on media supplemented with cytokinin only.” Schuller at page 23, col. 1. Thus, those skilled in the art would not generalize a method used in *Abies alba* with that used in maturation, a distinct growth phase, to arrive at the claimed invention. Applicants respectfully request withdrawal of the rejection.

Claims 50 and 52-54 remain rejected under 35 U.S.C. § 103(a) as unpatentable over Handley in view of Fan (U.S. Patent No. 6,689,609). As noted previously, the Examiner withdrew the rejection of these same claims by Fan in view of Handley. As noted above, those skilled in the art of conifer somatic embryogenesis understand that the distinct developmental phases require distinct media. The differences in the media are not limited to differences in growth hormones. The growth requirements (and carbon sources required) during induction, maintenance and prematuration, where cells must be maintained in a de-differentiated state and be supported for replication, are distinct from those in maturation and germination, in which cells must be allowed to properly differentiate and to stop replication. These distinct cellular programs require the use of different media and not simply a change in growth hormones. If the Examiner’s contention were true then no distinction between various carbon sources would be expected. The Examples provided in the instant specification, as well as the cited art, teach differently.

In addition, the Examiner notes that Applicants arguments regarding unexpected results were unpersuasive due to the lack of evidence of greater than expected results from the prior art. To the contrary, Example 1 shows a greater than 4 fold increase in induction by simply changing from sucrose to lactose in the induction medium; Example 3 compares maintenance and prematuration on media containing sucrose, maltose or lactose and lactose is shown to produce over 3 times as many embryos per gram compared to sucrose and almost 2 times more embryos per gram than maltose. It is unclear to Applicants how this direct comparison between media comprising distinct sugars is not a persuasive showing of unexpected results. These results would not have been expected based on the teachings of Handley and Fan, which equate use of various sugars in these media. The examples demonstrate much more than equivocal results with lactose as compared to other sugars. Applicants respectfully request withdrawal of the rejection and allowance of the claims.

Claims 55-63 remain rejected under 35 U.S.C. § 103(a) as unpatentable over Handley in view of Pullman (U.S. Patent No. 6,492,174). Applicants note, as above, that different developmental stages require different media and that use of a carbon source in one stage, like use of a growth hormone in one stage, can not simply be equated with use of the carbon source or growth hormone in a distinct developmental stage. In addition, the Examiner found the arguments regarding unexpected results using a combination of a galactose-containing sugar and an additional sugar in maintenance or prematuration medium unpersuasive. The Examiner fails to note the direct comparison in Example 10, on page 24 of the specification, to sucrose and maltose. In addition, the Examiner fails to note the other combinations of a galactose-containing

sugar with an additional sugar in the Examples, such as Example 2 (1.5% lactose with 0.025% glucose or 0.5% sucrose). Applicants respectfully request that the rejection be withdrawn.

## **Conclusion**

Accordingly, Applicants respectfully request withdrawal of the rejections and allowance of the claims. The Examiner is encouraged to contact the undersigned by telephone at the Examiner's convenience should any issues remain.

Respectfully submitted,

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